WHAT IS CLAIMED IS:

1.   An image reading apparatus including imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

individual light density distribution calculation means for calculating individual light density distributions of the transparent film original from density characteristics of the transparent original film and the color resolution signals output by the imaging means.

2.   The image reading apparatus as set forth in claim 1, wherein:

the density characteristics are individual light density curves of the transparent film original with respect to a predetermined color; and

the individual light density distribution calculation means obtains the density characteristics in advance and, when the color resolution signals are output by the imaging means, converts the color resolution signals to density equivalent values, obtains a value of a parameter showing the density of the transparent film original by linear conversion of the density equivalent values according to the density characteristics, and calculates the individual light density distributions of the transparent film original from the value of the parameter.

3.   The image reading apparatus as set forth in claim 1, wherein:

the density characteristics are individual light density curves of the transparent film original with respect to a plurality of predetermined colors; and

the individual light density distribution calculation means obtains the density characteristic in advance by performing colorimetry of the plurality of predetermined colors, correlates values of the color resolution signals readable by the imaging means to a value of a parameter showing a density of the transparent film original according to the density characteristics, and when the color resolution signals are output by the imaging means, obtains a value of the parameter from the color resolution signals based on the correlation, and calculates the individual light density distributions of the transparent film original from the value of the parameter.

4.   The image reading apparatus as set forth in any of claims 1-3, wherein the individual light density distribution calculation means changes the density characteristics which are used in the process of calculating the individual light density distributions according to a type of the transparent film original.

5.   The image reading apparatus as set forth in claim 4, further comprising:

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type obtaining means for obtaining the type of the transparent film original read by the imaging means.

6. The image reading apparatus as set forth in any of claims 1-5, further comprising:

transmitted light distribution calculation means for converting the individual light density distributions calculated by the individual light density distribution calculation means to individual light transmissivity distributions, and for calculating transmitted light distributions of the transparent film original from individual light distributions of a predetermined light source and the individual light transmissivity distributions.

7. The image reading apparatus as set forth in claim 6, further comprising:

table color system conversion means for calculating values of a predetermined table color system from the transmitted light distributions calculated by the transmitted light distribution calculation means.

8. An image reading apparatus including imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

table creation means for creating a table showing a correlation between values of a predetermined table color system and color resolution signals readable by the imaging means; and

table color system conversion means for converting the color resolution signals output by the imaging means to values of a predetermined table color system based on the table;

wherein, from density characteristics of the transparent film original and a plurality of versions of virtual color resolution signals readable by the imaging means, the table creation means calculates an individual light density distribution for each virtual color resolution signal, calculates values of a predetermined table color system from the individual light density distributions, and creates the table.

9. The image reading apparatus as set forth in claim 8, wherein:

the density characteristics are individual light density curves of the transparent film original with respect to a predetermined color; and

the table creation means obtains the density characteristics, converts each virtual color resolution signal to a density equivalent value, obtains a value of a parameter showing a density of the transparent film original by linear conversion of the density equivalent values according to the density characteristics, and calculates the individual light

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density distribution with respect to each virtual color resolution signal from a value of the parameter.

10. The image reading apparatus as set forth in claim 8, wherein:

the density characteristics are individual light density curves of the transparent film original with respect to a plurality of predetermined colors; and

the table creation means obtains the density characteristics by performing colorimetry of the plurality of predetermined colors, correlates values of the color resolution signals readable by the imaging means to a value of a parameter showing a density of the transparent film original, obtains a value of a parameter, based on the correlation, from a value of each virtual color resolution signal, and calculates the individual light density distribution with respect to each of the virtual color resolution signals from the value of the parameters.

11. The image reading apparatus as set forth in any of claims 8-10, wherein the table creation means changes the density characteristics which are used in the process of calculating the individual light density distributions for each virtual color resolution signal according to a type of the transparent film original.

12. The image reading apparatus as set forth in any of claims 8-11, wherein the table creation means converts the individual light density distributions to individual light transmissivity distributions, calculates transmitted light distributions from individual light distributions of a predetermined light source and the individual light transmissivity distributions, and calculates values of a predetermined table color system from the transmitted light distribution.

13. A program which performs signal processing by a computer with respect to color resolution signals of a plurality of colors read by an image reading apparatus having imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

an individual light density distribution calculation procedure which calculates individual light density distributions of the transparent film original from density characteristics of the transparent film original and the color resolution signals output by the imaging means.

14. A program which performs signal processing by a computer with respect to color resolution signals of a plurality of colors read by an image reading apparatus having imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

a table creation procedure which creates a table showing correlation between values of a predetermined table color system and color resolution signals read by the imaging means; and

a table color system conversion procedure which converts the color resolution signals read by the imaging means to values of a predetermined table color system based on the table;

wherein, from density characteristics of the transparent film original and a plurality of versions of virtual color resolution signals readable by the imaging means, the table creation procedure calculates an individual light density distribution for each virtual color resolution signal, calculates values of a predetermined table color system from the individual light density distributions, and creates the table.

15.   A recording medium, readable by a computer, which stores a program that performs signal processing by the computer with respect to color resolution signals of a plurality of colors read by an image reading apparatus having imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

an individual light density distribution calculation procedure which calculates individual light density distributions of the transparent film original from density characteristics of the transparent film original and the color resolution signals read by the imaging means.

16.   A recording medium, readable by a computer, which stores a program that performs signal processing by the computer with respect to color resolution signals of a plurality of colors read by an image reading apparatus having imaging means for reading a color image of a transparent film original to output color resolution signals of a plurality of colors, comprising:

a table creation procedure which creates a table showing correlation between values of a predetermined table color system and color resolution signals read by the imaging means; and

a table color system conversion procedure which converts the color resolution signals read by the imaging means to values of a predetermined table color system based on the table;

wherein, from density characteristics of the transparent film original and a plurality of versions of virtual color resolution signals readable by the imaging means, the table creation procedure calculates an individual light density distribution for each virtual

color resolution signal, calculates values of a predetermined table color system from the individual light density distributions, and creates the table.

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